

## **Long Branch Lake 1999 Water Quality Report**

### **1. General.**

a. **Project location.** Long Branch Dam is located at approximately river mile 68 on the East Fork of the Little Chariton River, 1 mile west of Macon, Missouri. The Long Branch arm of the Y-shaped reservoir parallels the East Fork arm. The drainage area of the stream above the dam is 109 square miles.

b. **Authorized project purposes.** Flood control, water supply, and water quality control are the primary project purposes; equally important, however, are its fish and wildlife resources and recreation benefits. A State Park with marina and swimming beach is located near the dam.

### **c. Pertinent data.**

Pools	Surface Elevation (ft. above m.s.l.)	Current Capacity (1,000 A.F.)	Surface Area (acres)	Shoreline (miles)
Flood Control	801.0	30.3	3,670	
Multipurpose	791.0	34.2	2,430	24
Inactive		3.5*		
Total		64.5		

Total Drainage Area: 109 sq. miles  
Average Annual Inflow: 81,780 acre-feet

\* Contained in multipurpose pool.

### **2. Activities and studies of the year.**

Monthly herbicide and nutrient sampling was conducted by lake project personnel, with technical and analytical support from PM-PR-W, April-September 1999 at two inflow stations, three lake stations (two depths), and the outlet. Nutrient samples were shipped to the Chemical and Materials Quality Assurance Laboratory (CMQAL) in Omaha for analysis while the herbicide samples were shipped to the PM-PR-W laboratory for analysis of four of the most commonly occurring herbicides by the ELISA (enzyme linked immunosorbent assay) method. Ten percent of the herbicide samples were shipped to the CMQAL to be analyzed by Gas Chromatography (GC) for quality control purposes. All generated data were entered in excel spreadsheets as an interim to the EPA national water quality data management system, NEW

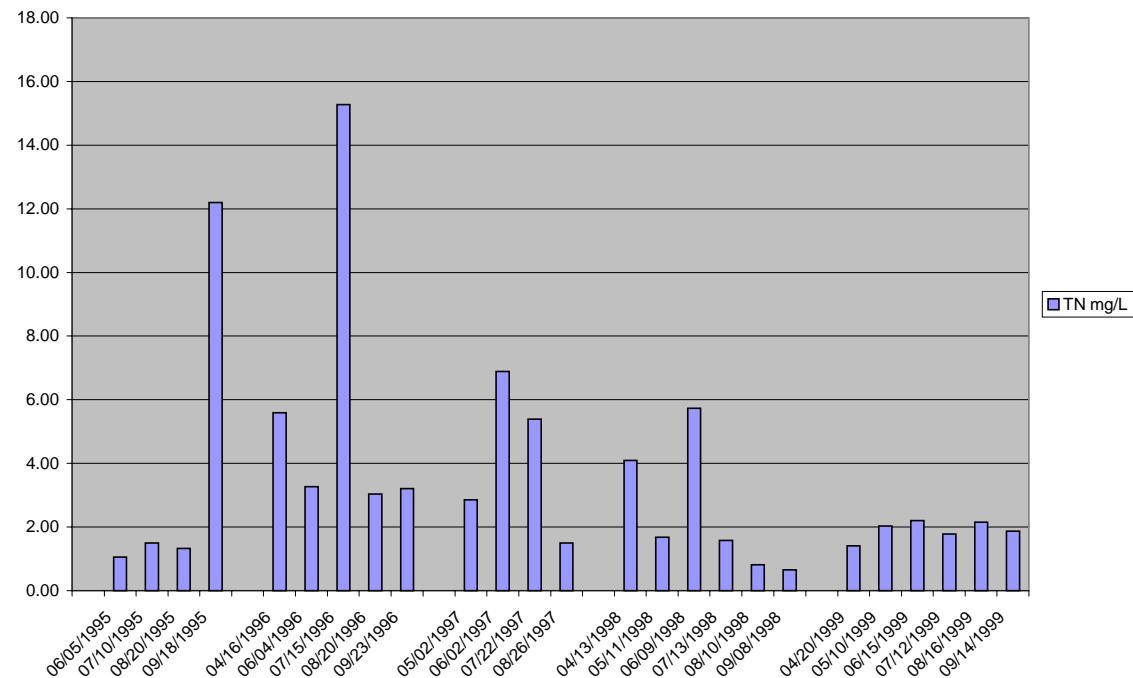
STORET, which is still in the developmental stage. Table 1 at the end of this report includes all the available nutrient and herbicide data for the past years from 1995-1999.

The OF-LB is to be commended for its continued support of water quality monitoring of Long Branch Lake and its tributaries. The OF-LB personnel deserving special recognition include Messrs. Mike Monda, Don Goers, and Paul Sampson.

### 3. Existing conditions.

a. **Inflow.** During the period of record, the total ammonia (NH<sub>3</sub>) concentrations in Long Branch have frequently exceeded the Missouri chronic criterion for a warm water fishery. It is quite probable that these levels reflected the impact of the discharges from the Atlanta, Missouri, waste treatment plant. However, no elevated concentrations were noted in the 1999 surveys. Mean and maximum total NH<sub>3</sub> concentrations were 0.10 mg/L and 0.15 mg/L, respectively. Total Kjeldahl nitrogen (TKN) continued to be within a hypereutrophic range in 1999 with mean and maximum concentrations of 1.44 mg/L and 2.13 mg/L, respectively. The nitrite/nitrate (NO<sub>2</sub>/NO<sub>3</sub>) levels were generally lower with mean and maximum concentrations of 0.51 mg/L and 0.72 mg/L, respectively. The calculated total nitrogen (NH<sub>3</sub>, NO<sub>2</sub>, NO<sub>3</sub>, and TKN)

**FIGURE 1: LB-18**

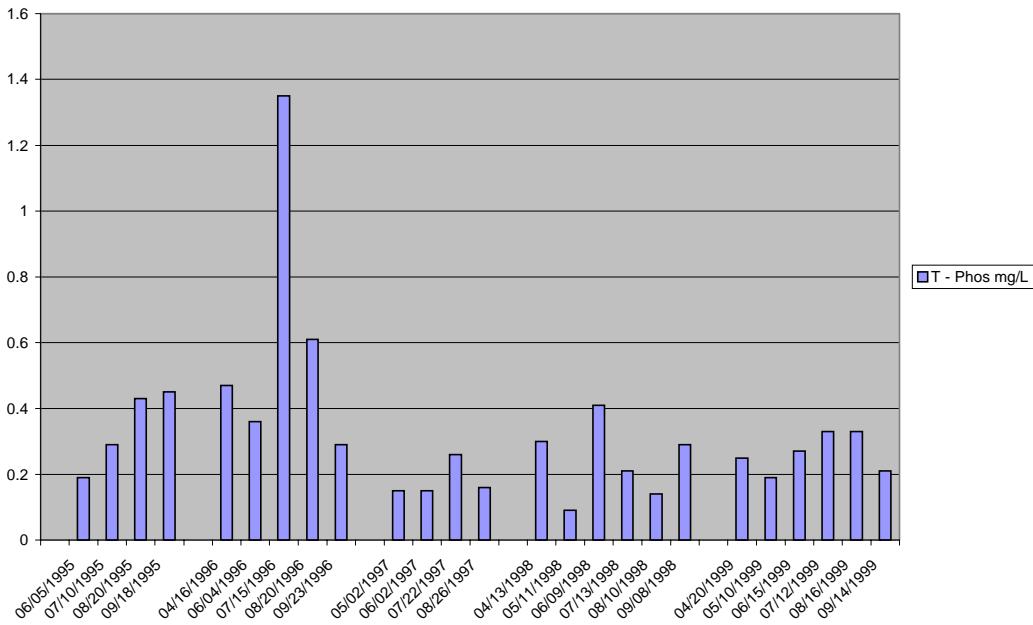


concentrations for April-September were 1.41 mg/L, 2.02 mg/L, 2.21 mg/L, 1.78 mg/L, 2.15 mg/L, and 1.87 mg/L, respectively. Over the entire period of record, observed TN concentrations have usually been eutrophic and occasionally hypereutrophic, indicating excessive nutrient loading to the small stream. Figure 1 shows this trend over the past five years.

The 1999 total phosphorus (TP) concentrations (mean and maximum of 0.26 mg/L and 0.33 mg/L, respectively) in Long Branch continued to exceed the generalized stream eutrophy

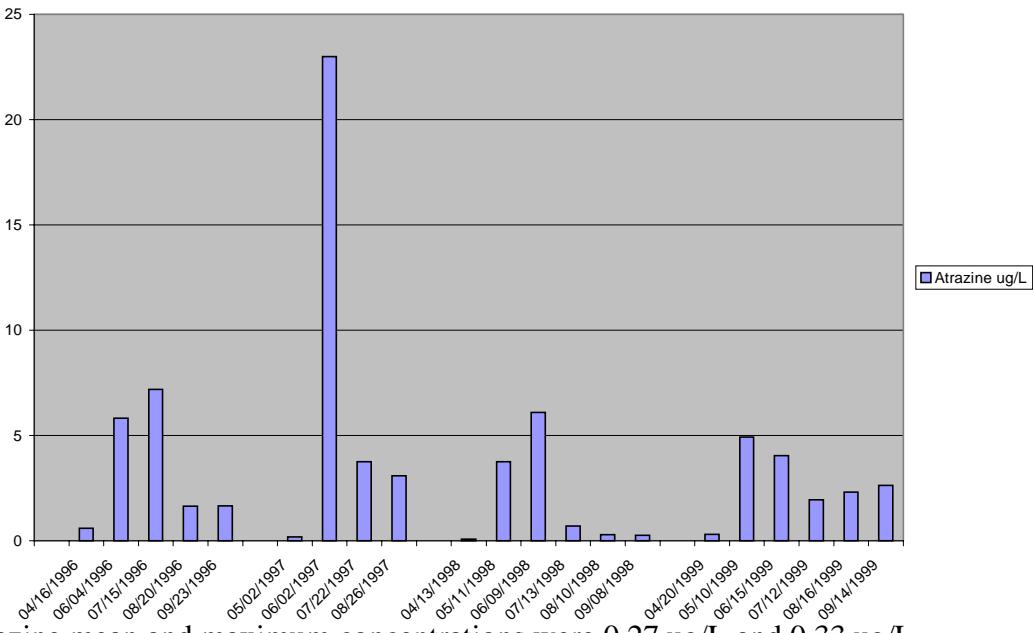
criterion of 0.10 mg/L. Historically, maximum observed TP concentrations generally have been within the hypereutrophic range, and minimum values have usually exceeded the criterion for the protection of aquatic ecosystems from excessive eutrophication. Figure 2 shows the trend for the past five years. The high spikes occur during periods of high inflow.

FIGURE 2: LB-18



Four herbicides (atrazine, cyanazine, alachlor, and metolachlor) were again detected in Long Branch. During May and June survey periods, atrazine concentrations exceeded the criterion for protection of aquatic life (1 ug/L) and the drinking water supply MCL of 3 ug/L. The mean and maximum atrazine concentrations in 1999 were 2.70 ug/L and 4.93 ug/L, respectively. As noted in past years, the highest value was present in May and June associated with post application run-off. Atrazine has been frequently observed to exceed both criteria over the period of record.

FIGURE 3: LB-18



And, since conventional treatment processes do not remove herbicides, activated carbon filtration is required for the water to be suitable for a drinking water supply. Figure 3 shows the trend for atrazine over the past 4 years. The cyanazine mean and maximum concentrations were 0.27 ug/L and 0.33 ug/L,

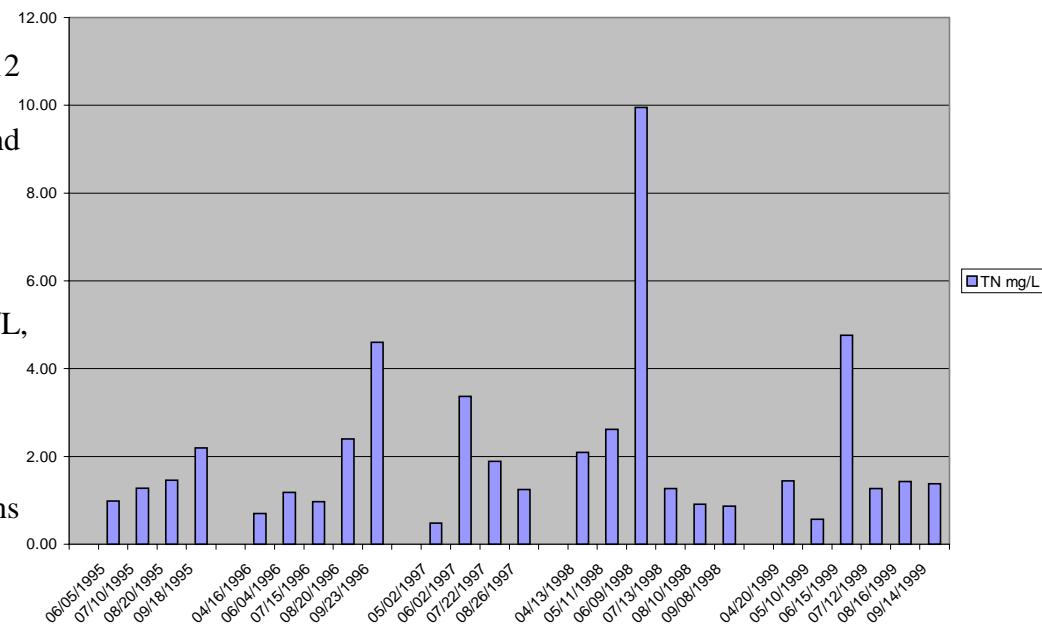
respectively, in 1999. The EPA has not set a MCL for cyanazine, but the suggested concentration or the maximum contaminant level goal (MCLG) is 1 ug/L. And, while the mean annual concentration in the small stream did not exceed this level, the criterion has frequently been exceeded over the period of record. The 1999 mean and maximum alachlor concentrations were 0.16 ug/L and 0.23 ug/L, respectively. None of the samples exceeded the 2 ug/L MCL. However, alachlor concentrations over the period of record have frequently exceeded the drinking water criterion. Metolachlor mean and maximum concentrations were 1.27 ug/L and 2.38 ug/L, respectively. To date no MCL has been established for this herbicide. These and past data clearly show the heavy pesticide loading to the stream during post-application, spring and early summer, storm run-off events.

Fecal coliform analyses were not performed in 1999; however, bacterial densities in past surveys have frequently been at levels several times the State criterion of a log mean not to exceed 2,000 colonies/100 mL. The proximity of the waste treatment plant and the livestock operations in the watershed suggest the bacterial densities are attributable to point and non-point source run-off. For the period of record, the log mean for fecal coliform is 1,600 colonies/100 mL.

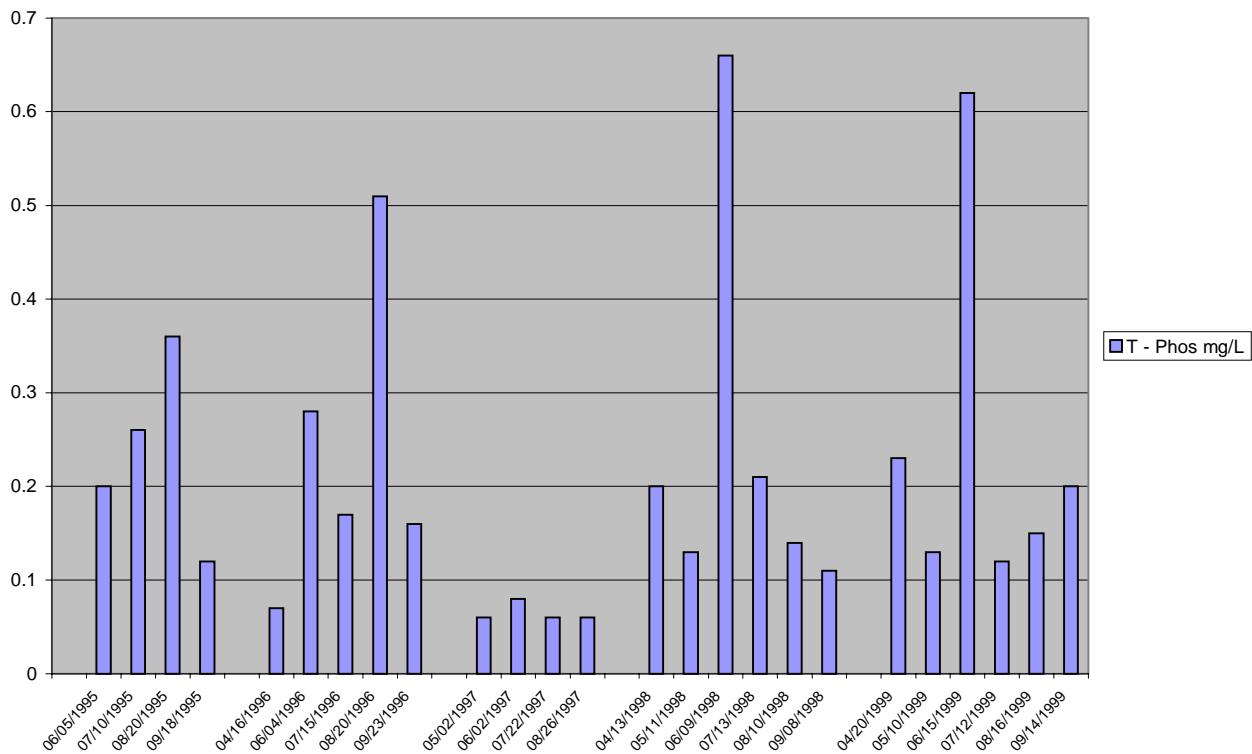
Nitrogen forms in the East Fork were comparable to those in Long Branch in 1999. The mean and maximum concentrations were as follows:

NH<sub>3</sub>, 0.11 mg/L and 0.12 mg/L; TKN, 1.31 mg/L and 2.82 mg/L; and NO<sub>2</sub>/NO<sub>3</sub>, 0.71 mg/L and 1.82 mg/L, respectively. Calculated total nitrogen concentrations for the April-September survey periods were 1.45 mg/L, 0.57 mg/L, 4.76 mg/L, 1.27 mg/L, 1.43 mg/L, and 1.38 mg/L, respectively. The June level reflected excessive nutrient loading associated with storm run-off. The stream eutrophy criterion of 0.1 mg/L TP was exceeded during 5 of the 1999 survey periods. Mean and maximum TP concentrations were 0.24 mg/L and 0.62 mg/L, respectively. Period of record data continue to show the heavy, long-term nutrient loading to the small stream. This can be seen in figures 4 and 5, which shows this trend for the past five years.

**FIGURE 4: LB-19**



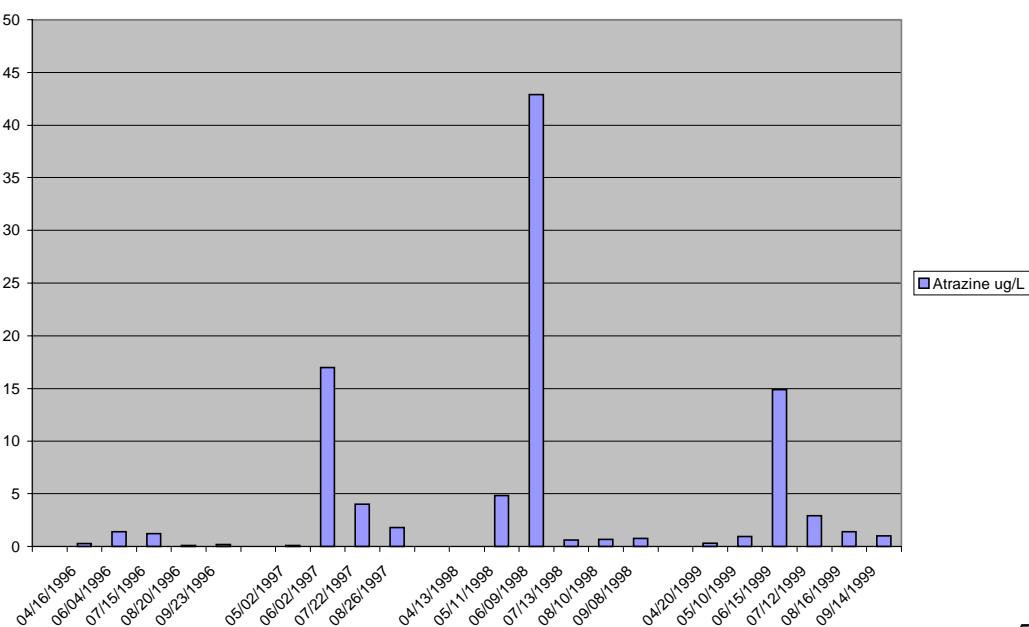
**FIGURE 5: LB-19**



A scan of pesticides and other toxicants detected four herbicides (atrazine, cyanazine, alachlor, and metolachlor) in the East Fork during 1999. Atrazine concentrations

exceeded the aquatic life protection criterion (1 ug/L) and the MCL for drinking water supply (3 ug/L) in June (14.90 ug/L). The 1999 mean and maximum atrazine concentrations (3.58 ug/L and

**FIGURE 6: LB-19**

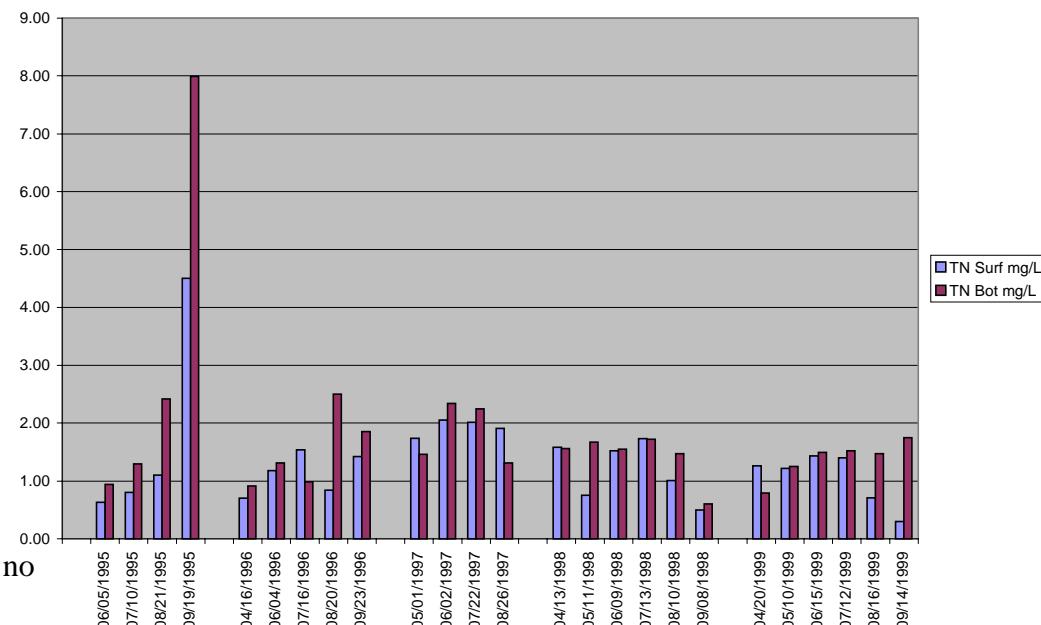


14.90 ug/L, respectively) reflect the period of record atrazine data, which show an almost continuous exceedence of the EPA criteria. Figure 6 shows the trend for atrazine over the past four years. The mean and maximum concentrations of cyanazine were 0.12 ug/L and 0.26 ug/L, respectively. None of the samples exceeded the MCLG of 1 ug/L, however, the exceedence of this criterion has been frequently observed over the period of record. The mean (0.10 ug/L) and maximum (0.20 ug/L)

concentrations of alachlor were typical for the small stream.

The final herbicide, metolachlor, had mean and maximum concentrations of 0.51 ug/L and 1.39 ug/L, respectively. As noted previously, no MCL has been established for it.

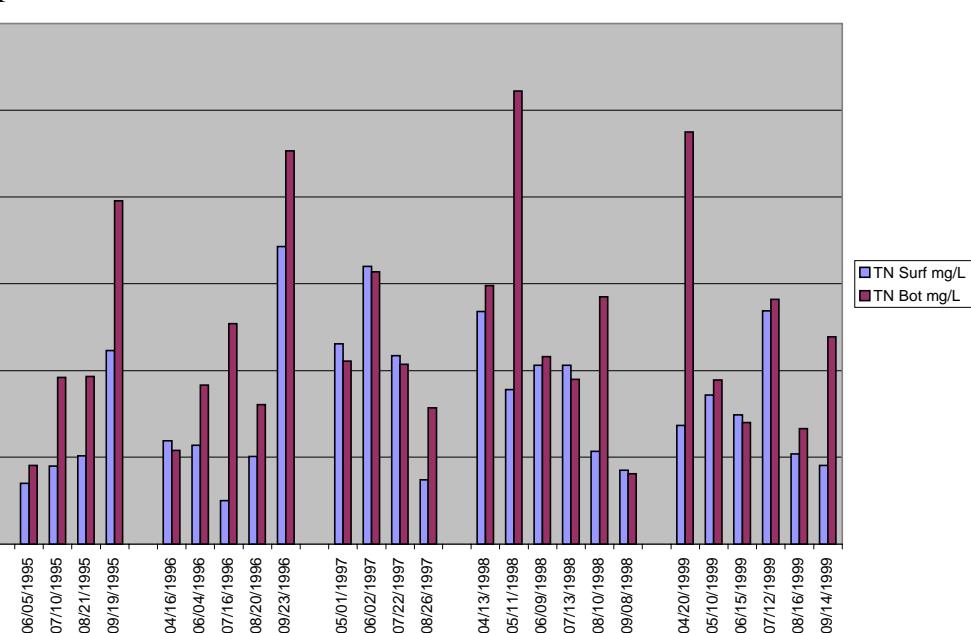
FIGURE 7: LB-4



b. **Lake.** Nutrient levels in the reservoir have historically been elevated as a result of the significant erosional contribution of the inflows.

FIGURE 8: LB-10

The uplake portion of the East Fork arm typically exhibits the highest nutrient concentrations presumably because of the greater nutrient loading from its larger drainage area. The lowest nutrient concentrations are



present in the downlake area, as a result of uptake or sedimentation in the uplake areas. And, from a depth standpoint, bottom concentrations throughout the reservoir are substantially higher than surface concentrations, but, as a result of

FIGURE 9: LB-11

summer stratification, are not available for uptake by the algal populations residing in the upper strata or epilimnion. Once stratification is broken down in September, the potential for greater

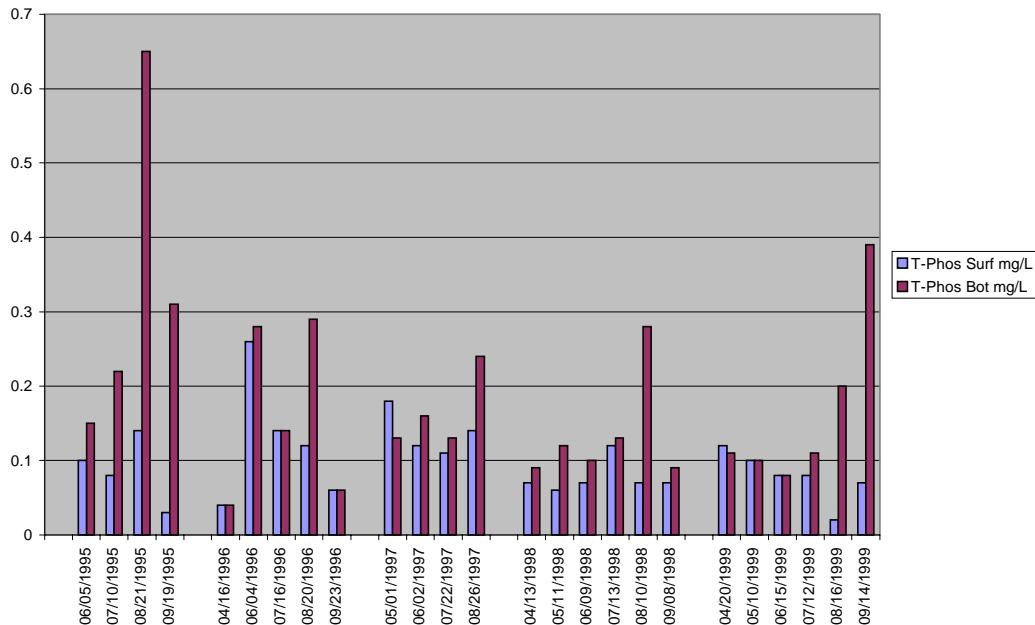
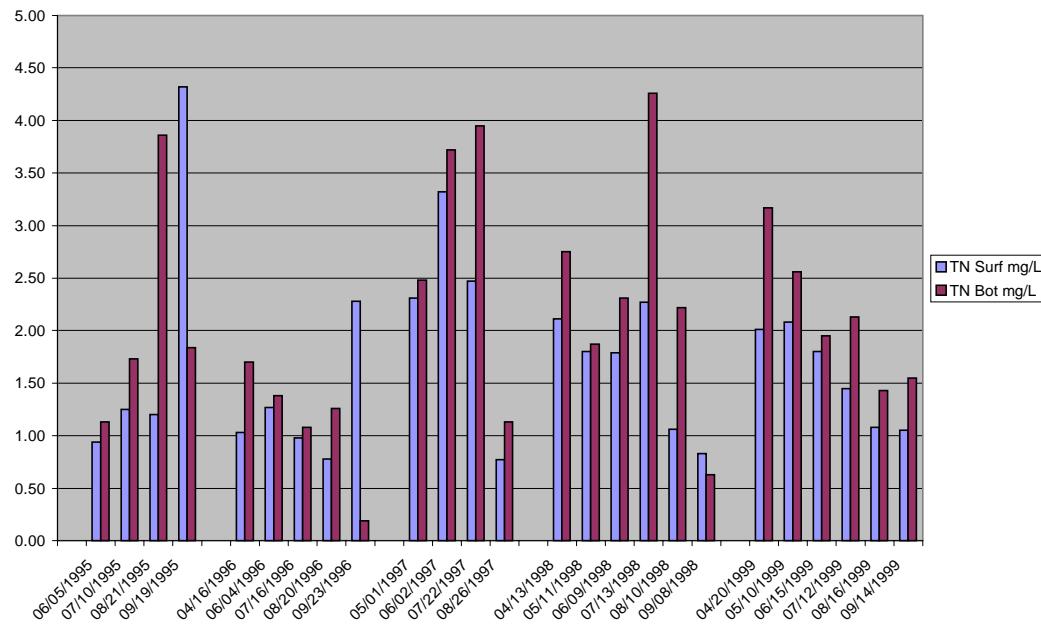
utilization of available nutrients is increased, which can result in taste and odor problems in the fall drinking water supplies. Figures 7, 8, and 9 show the relationship between surface and bottom total nitrogen concentrations for the

FIGURE 10: LB-4 Lake

past five years throughout the lake. The high spikes can be attributed to high inflows and temperature differences between surface and bottom waters.

#### The 1999 total nitrogen

concentrations in the surface waters of the Long Branch arm (mean 1.54 mg/L and maximum 2.69 mg/L) and East Fork arm (mean 1.58 mg/L and maximum 2.08 mg/L) were indicative of the highly enriched nature of the impoundment over the period of record. The down lake area with



mean and maximum TN concentrations of 1.05 mg/L and 1.40 mg/L, respectively, exhibited only slightly lower nutrient levels. Values in the bottom waters were consistently higher than those of the surface waters with mean and maximum concentrations of 2.43 mg/L and 4.75 mg/L, respectively, at LB-10, 2.13 mg/L and 3.17 mg/L, respectively, at LB-11, and at LB-4, 1.38 mg/L and 1.75 mg/L, respectively.

Total phosphorus concentrations throughout the reservoir exceeded the 0.05 mg/L eutrophy criterion in 97% of the 1999 survey periods.

The mean and maximum TP concentrations in the surface waters were Long Branch, 0.15 mg/L and 0.37 mg/L; East Fork, 0.15 mg/L and 0.17 mg/L; and downlake, 0.08 mg/L and 0.12 mg/L, respectively. The mean and maximum TP concentrations in the bottom waters were

Long Branch, 0.32 mg/L and 0.58 mg/L; East Fork, 0.34 mg/L and 0.54 mg/L; and downlake 0.17 mg/L and 0.39 mg/L. Figures 10, 11, and 12 show total phosphorus concentrations at the surface and bottom depths throughout the lake from 1995-1999.

The total phosphorus concentrations tend to follow the same pattern as the total nitrogen

FIGURE 11: LB-10

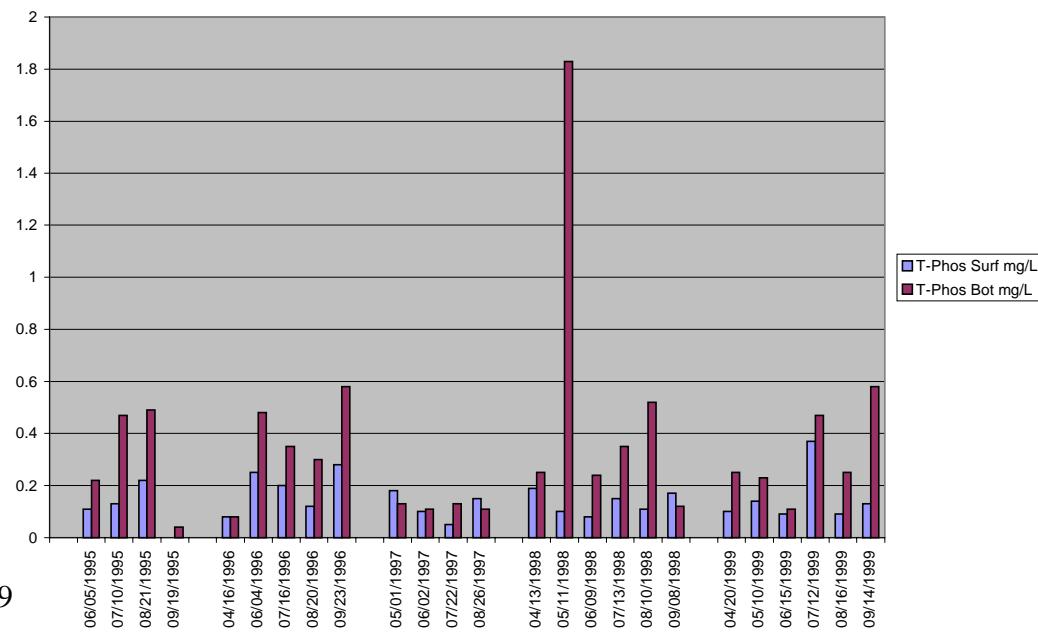
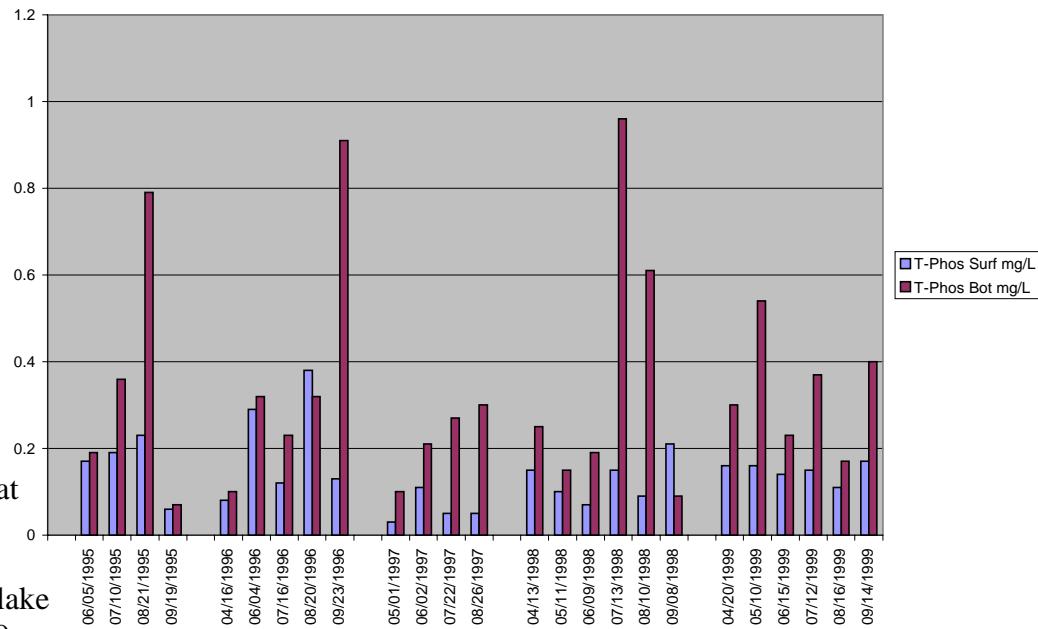


FIGURE 12: LB-11



concentrations.

Four herbicides (atrazine, cyanazine, alachlor, and metolachlor) were detected during the 1999 surveys. Atrazine concentrations in the upper portions of the impoundment exceeded the MCL of 3 ug/L in May and July. The mean and maximum atrazine concentrations in the surface waters were as follows, East Fork arm,

1.89 ug/L and 2.79 ug/L; Long Branch arm, 2.07 ug/L and 2.97 ug/L; and

downlake, 1.48 ug/L and 2.25 ug/L, respectively. Bottom mean and maximum concentrations were higher, East Fork arm, 2.02 ug/L and 2.24 ug/L; Long Branch arm, 3.92 ug/L and 10.90 ug/L; and downlake, 1.54 ug/L and 2.86 ug/L, respectively. Figures 13, 14, and 15 show the trend for atrazine for the years 1996-1999. As can be seen from these graphs, higher concentrations occur within the lake during

early spring run-off periods.

Again, the high spikes can be attributed to these high flow seasons and temperature differences within the water column. Cyanazine

concentrations

FIGURE 13: LB-4

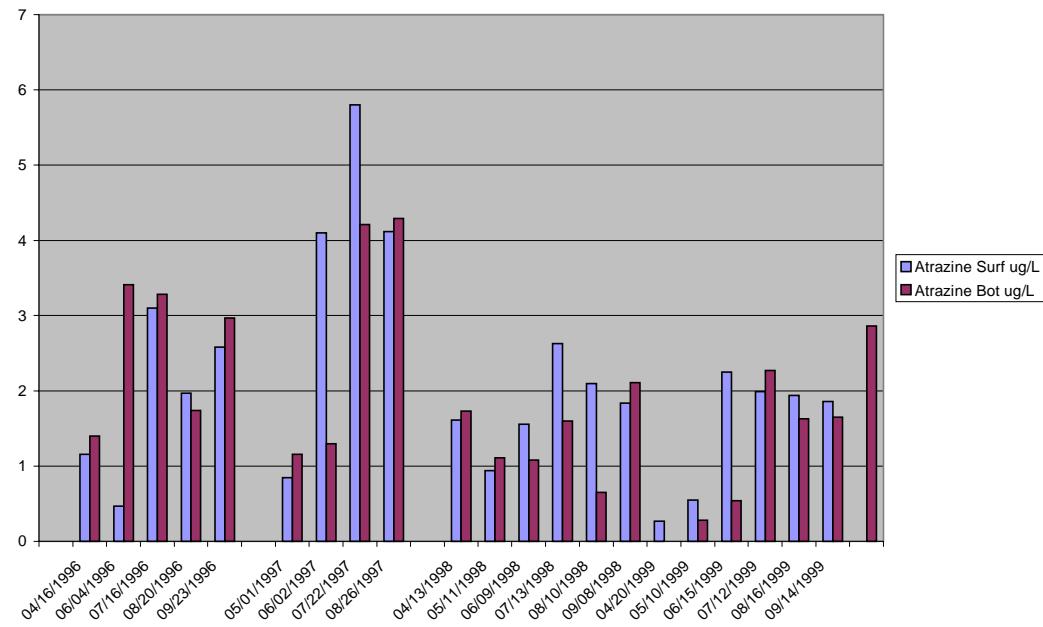
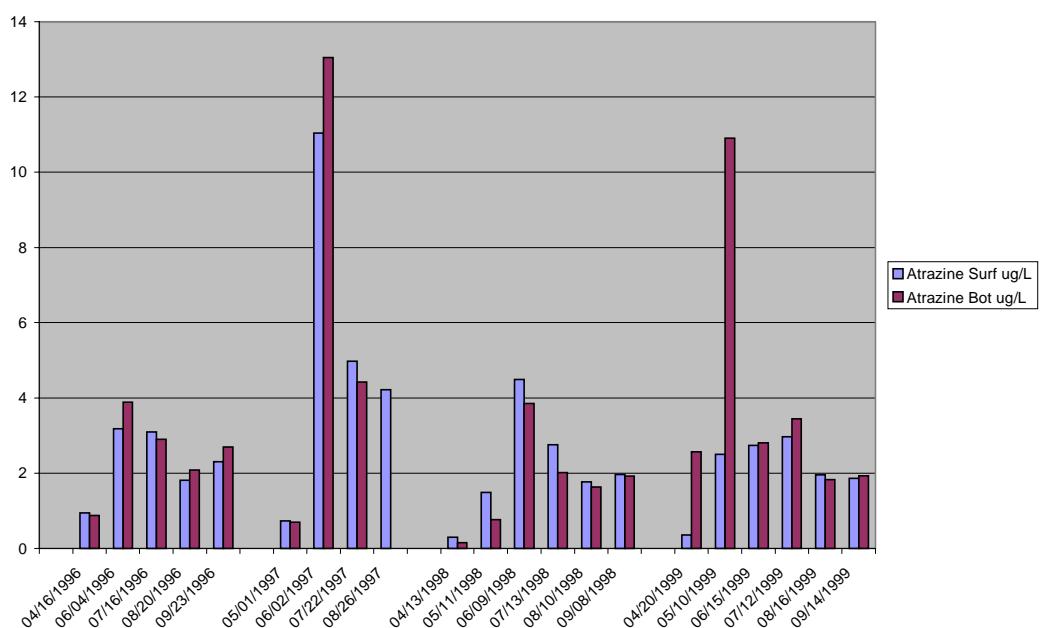


FIGURE 14: LB-10



did not exceed the MCLG of 1 ug/L in any of the 1999 samples. The mean and maximum cyanazine concentrations in the surface waters were as follows, East

Fork, 0.15 ug/L and 0.17 ug/L; Long Branch, 0.15 ug/L and 0.37 ug/L; and downlake, 0.08 ug/L and 0.12 ug/L, respectively.

No alachlor samples exceeded the MCL of 2 ug/L. Mean and maximum concentrations of

alachlor in the surface waters were East Fork, 0.09 ug/L and 0.09 ug/L, Long Branch, 0.10 ug/L and 0.14 ug/L, and downlake 0.06 ug/L and 0.07 ug/L, respectively. Metolachlor mean and maximum concentrations in the surface waters were East Fork, 0.66 ug/L and 0.99 ug/L; Long Branch, 0.78 ug/L and 1.43 ug/L; and downlake, 0.65 ug/L and 0.88 ug/L, respectively. Since no MCL has been established for metolachlor, the significance of the concentrations in the reservoir can not be determined. Nevertheless, the period of record data indicate the MCLs for atrazine, cyanazine, and alachlor have been

frequently exceeded. The reservoir acts as a pesticide sink receiving very high pesticide loading during the post-application, storm run-off events and slowly discharging the diluted

FIGURE 15: LB-11

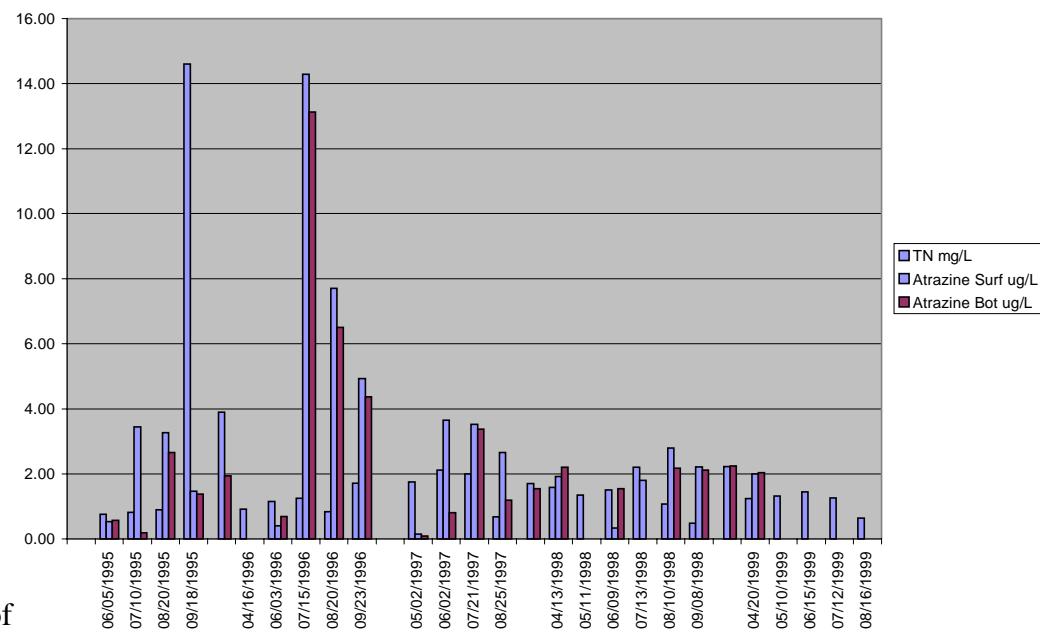
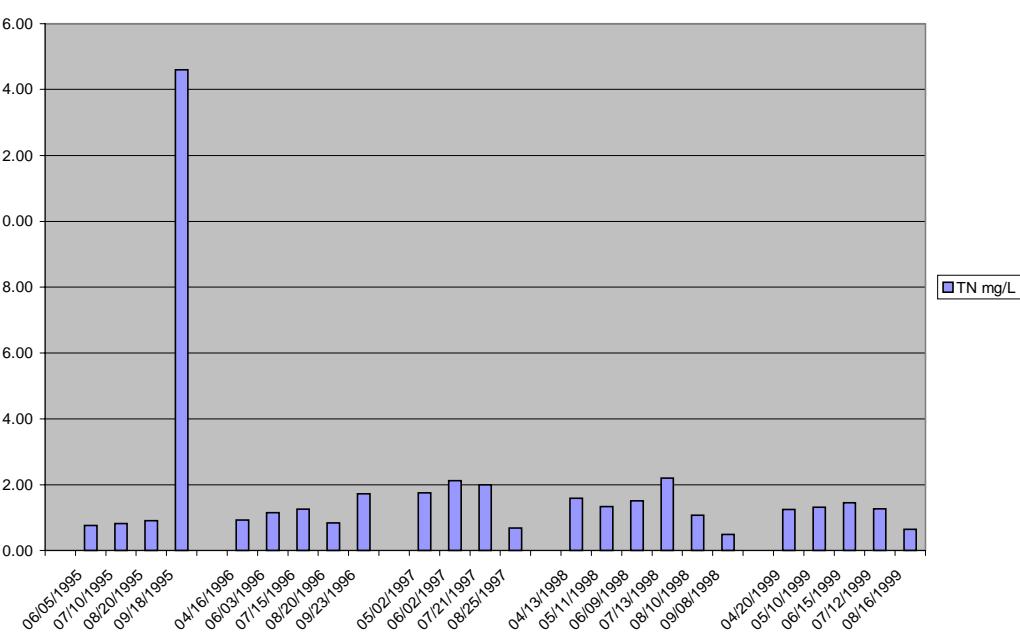


FIGURE 16: LB-3

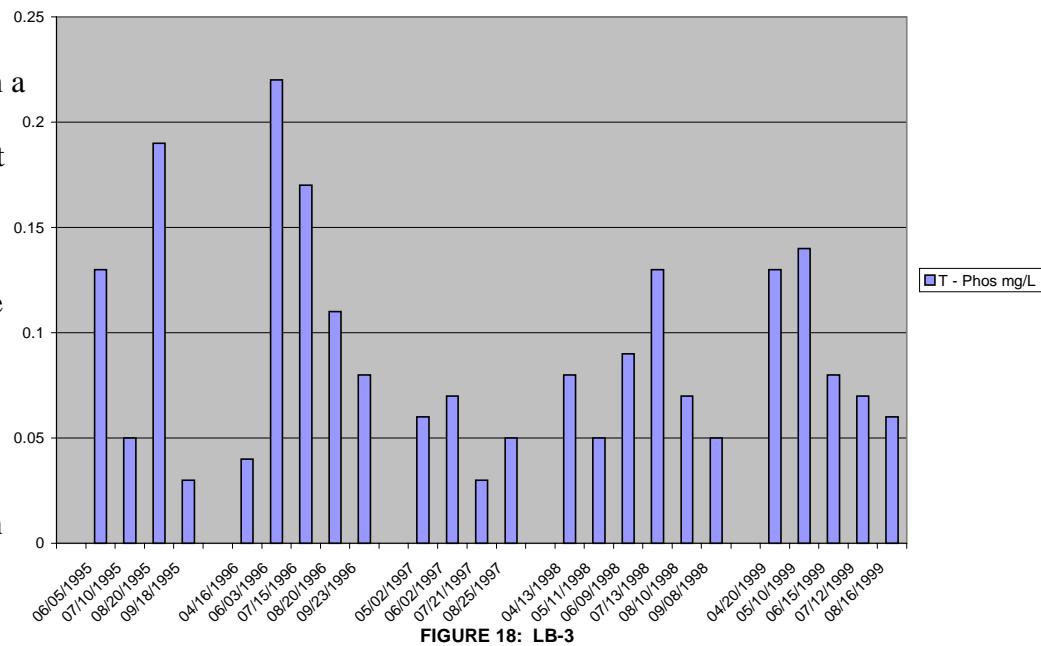


concentrations over the remainder of the water year. And, as noted previously, since conventional water treatment does not remove herbicides, the water must receive additional treatment in the form of activated carbon filtration to meet established water supply criteria.

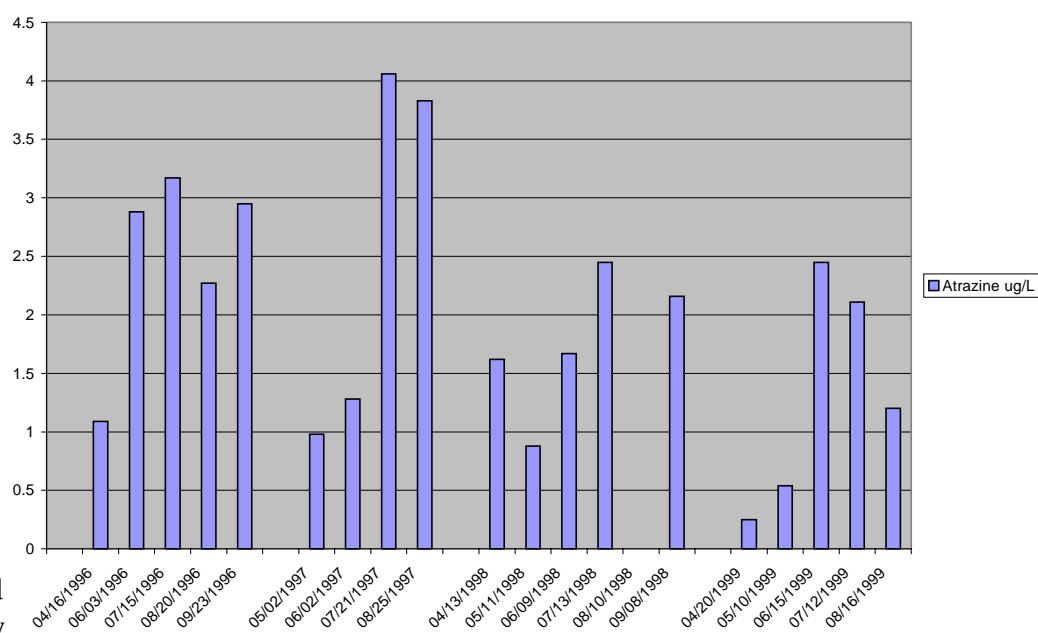
c. **Outflow.** Total nitrogen and total phosphorus concentrations continued to be in a lower eutrophic range in the outlet than in the inflow streams indicating substantial uptake of nutrients and sedimentation within the impoundment. The stream eutrophy criterion of 1 mg/L TN was, however, exceeded in all months except August, no sample was collected in September. Total nitrogen mean, minimum, and maximum concentrations in the outlet were 1.18 mg/L, 0.64 mg/L, and 1.45 mg/L, respectively.

The generalized stream eutrophy criterion for total phosphorus (0.1 mg/L) was exceeded in April and May. Total phosphorus mean, minimum, and maximum concentrations were 0.10 mg/L, 0.06 mg/L, and 0.14 mg/L, respectively. Figures 16 and 17 show the trend for the past five years. Again, the high spikes are due to high flow conditions.

**FIGURE 17: LB-3**



**FIGURE 18: LB-3**



The four herbicides (atrazine, cyanazine, alachlor, and metolachlor) present throughout the system were also detected in reduced amounts in the outlet samples. There was no exceedence of established criteria during 1999 surveys. Atrazine mean and maximum concentrations were 1.31 ug/L and 2.45 ug/L, respectively. Figure 18 shows the trend for 1996-1999. The mean and maximum concentrations of cyanazine were 0.12 ug/L and 0.16 ug/L, respectively. Alachlor mean and maximum concentrations were 0.006 ug/L and 0.06 ug/L, respectively. Metolachlor concentrations in the reservoir discharge were also low with mean and maximum concentrations of 0.61 ug/L and 0.81 ug/L, respectively. As noted previously, the water quality concern associated with these concentrations can not be determined since no MCL has been established for metolachlor.

#### **4. Future conditions.**

The general water quality of Long Branch Lake is only moderately good. The main problems in the dimictic reservoir are turbidity, significant suspended solids and nutrient loading, high iron and manganese levels, and hypolimnetic oxygen depletion during the summer. Pesticide loading may, however, prove to be the most significant factor in the reservoir's ecosystem and water supply benefits. If land use practices within the watershed do not change, (i.e., agricultural practices do not include reductions in soil erosion and in herbicide and fertilizer usage), the reservoir could potentially reach a point at which it is unable to assimilate the increased loading of silt, nutrients, and pesticides. The water supply, recreation, and sport fishery benefits would then be severely impaired or lost.

#### **5. Recommendations.**

Because of the continued support of OF-LB, the cooperative water quality monitoring program should be funded for 2000. The investigations should include monthly nutrient and pesticide analyses from April-September. The District should continue to support efforts in developing a multi-agency watershed monitoring and pollution reduction program for Long Branch Lake in 2001.

**TABLE 1: LONGBRANCH LAKE DATA 1995-1999**

Station	Depth (M)	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
LB-3	0.1	06/05/1995	0830					0.16		0.6	0.76	0.13	0.08
	0.1	07/10/1995	0800					0.02		0.8	0.82	0.05	<0.01
	0.1	08/20/1995	1445					<0.02		0.9	0.90	0.19	0.01
	0.1	09/18/1995	1650					<0.02		14.6	14.60	0.03	<0.01
Average								0.09		4.23	4.27	0.10	0.05
LB-3	0.1	04/16/1996	1300	1.09	0.28	0.08	0.96	<0.02	0.22	0.7	0.92	0.04	0.01
	0.1	06/03/1996	1600	2.88	0.36	1.18	2.81	0.25	0.3	0.6	1.15	0.22	0.04
	0.1	07/15/1996	1420	3.17	0.19	1.02	2.75	0.07	0.48	0.7	1.25	0.17	0.01
	0.1	08/20/1996	0750	2.27	0.13	0.52	2.28	<0.02	0.14	0.7	0.84	0.11	<0.01
	0.1	09/23/1996	0700	2.95	0.14	0.69	2.17	0.1	0.12	1.5	1.72	0.08	0.03
Average				2.47	0.22	0.70	2.19	0.14	0.25	0.84	1.18	0.12	0.02
LB-3	0.1	05/02/1997	1215	0.98	0.1	0.08	0.97	0.09	0.76	0.9	1.75	0.06	
	0.1	06/02/1997	0910	1.28	0.07	0.28	1.01	0.32	0.8	1	2.12	0.07	0.03
	0.1	07/21/1997	1445	4.06	0.33	1.49	2.5	0.07	0.73	1.2	2.00	0.03	0.02
	0.1	08/25/1997	1530	3.83	0.15	0.85	2.14	<0.02	0.08	0.6	0.68	0.05	0.02
Average				2.54	0.16	0.68	1.66	0.16	0.59	0.93	1.64	0.05	0.02
LB-3	0.1	04/13/1998	1120	1.62	<0.05	0.22	0.97	0.06	0.52	1	1.58	0.08	0.04
	0.1	05/11/1998	1130	0.88	0.08	0.15	0.49	0.02	0.62	0.7	1.34	0.05	0.01
	0.1	06/09/1998	0735	1.67	0.06	0.48	0.73	0.11	0.7	0.7	1.51	0.09	0.06
	0.1	07/13/1998	0730	2.45	0.27	0.77	1.11	0.35	0.65	1.2	2.20	0.13	0.03
	0.1	08/10/1998	0835					<0.02	0.27	0.8	1.07	0.07	0.04
	0.1	09/08/1998	0745	2.16	0.11	0.38	0.8	0.04	0.05	0.4	0.49	0.05	0.03
Average				1.76	0.13	0.40	0.82	0.12	0.47	0.80	1.37	0.08	0.04
LB-3	0.1	04/20/1999	1150	0.25	<0.05	<0.05	0.09	U	0.78	0.46	1.24	0.13	0.06
	0.1	05/10/1999	0800	0.54	<0.05	0.25	0.09	U	0.9	0.42	1.32	0.14	0.04
	0.1	06/15/1999	0715	2.45	0.06	0.81	0.16	U	0.78	0.67	1.45	0.08	0.04
	0.1	07/12/1999	0845	2.11	0.06	0.8	0.16	U	0.61	0.65	1.26	0.07	0.02
	0.1	08/16/1999	0715	1.2	<0.05	0.56	0.1	U	0.18	0.46	0.64	0.06	0.02
Average				1.31	0.06	0.61	0.12		0.65	0.53	1.18	0.10	0.04
LB-4	0.1	06/05/1995	0950					0.13		0.5	0.63	0.1	0.06
	0.1	07/10/1995	0920					<0.02		0.8	0.80	0.08	0.02
	0.1	08/21/1995	0920					<0.02		1.1	1.10	0.14	0.02
	0.1	09/19/1995	1000					<0.02		4.5	4.50	0.03	<0.01
Average								0.13		1.73	1.86	3.58	7.16

Station	Depth (M)	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
LB-4	0.1	04/16/1996	0940	1.16	0.31	0.23	1.03	<0.02	0.2	0.5	0.70	0.04	0.01
	0.1	06/04/1996	0930	0.47	<0.05	0.18	0.59	0.08	0.4	0.7	1.18	0.26	0.05
	0.1	07/16/1996	0925	3.1	0.2	<0.10	1.5	0.04	0.5	1	1.54	0.14	0.01
	0.1	08/20/1996	0945	1.97	0.11	0.54	1.91	0.13	0.11	0.6	0.84	0.12	<0.01
	0.1	09/23/1996	1040	2.58	0.12	0.59	2.28	0.06	0.16	1.2	1.42	0.06	0.04
Average				1.86	0.19	0.39	1.46	0.08	0.27	0.80	1.14	0.12	0.03
LB-4	0.1	05/01/1997	1308	0.85	<0.05	0.05	0.96	0.25	0.79	0.7	1.74	0.18	
	0.1	06/02/1997	1030	4.1	<0.10	0.8	<0.10	0.04	0.81	1.2	2.05	0.12	0.04
	0.1	07/22/1997	0910	5.8	<0.10	<0.10	3	0.88	0.13	1	2.01	0.11	0.02
	0.1	08/26/1997	0920	4.12	0.22	0.94	2.27	<0.02	0.31	1.6	1.91	0.14	0.03
	Average			3.72	0.22	0.60	2.08	0.39	0.51	1.13	1.93	0.14	0.03
LB-4	0.1	04/13/1998	1100	1.61	<0.05	0.17	0.96	0.05	0.53	1	1.58	0.07	0.04
	0.1	05/11/1998	0945	0.94	0.09	0.13	0.51	0.03	0.63	0.09	0.75	0.06	0.02
	0.1	06/09/1998	1100	1.56	0.11	0.44	0.71	0.1	0.72	0.7	1.52	0.07	0.06
	0.1	07/13/1998	0915	2.63	0.24	0.75	1.15	0.07	0.66	1	1.73	0.12	0.02
	0.1	08/10/1998	1040	2.1	0.08	0.45	0.93	0.07	0.24	0.7	1.01	0.07	0.03
	Average			1.84	0.08	0.35	0.8	0.06	0.04	0.4	0.50	0.07	0.02
LB-4	Average			1.78	0.12	0.38	0.84	0.06	0.47	0.65	1.18	0.08	0.03
	0.1	04/20/1999	0915	0.27	<0.05	<0.05	0.08	0.06	0.76	0.44	1.26	0.12	0.06
	0.1	05/10/1999	1010	0.55	<0.05	0.26	0.09	U	0.9	0.32	1.22	0.1	0.06
	0.1	06/15/1999	0955	2.25	0.07	0.78	0.16	U	0.8	0.63	1.43	0.08	0.04
	0.1	07/12/1999	0825	1.99	0.06	0.92	0.2	0.1	0.61	0.69	1.40	0.08	0.03
	0.1	08/16/1999	0940	1.94	0.05	0.5	0.14	0.02	0.18	0.51	0.71	0.02	0.01
	Average			1.86	<0.05	0.6	0.11	0.06	U	0.24	0.30	0.07	0.01
LB-4	Average			1.48	0.06	0.61	0.13	0.06	0.65	0.47	1.05	0.08	0.04
	10	06/05/1995	1000					0.24		0.7	0.94	0.15	0.1
	13	07/10/1995	0933					0.19		1.1	1.29	0.22	0.1
	9	08/21/1995	0929					0.62		1.8	2.42	0.65	0.23
	9	09/19/1995	1009					0.89		7.1	7.99	0.31	0.08
Average								0.49		2.68	3.16	0.33	0.13

Station	Depth (M)	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
LB-4	8	04/16/1996	0948	1.4	0.28	0.17	0.95	<0.02	0.21	0.7	0.91	0.04	0.01
	9	06/04/1996	0939	3.41	0.47	1.36	2.99	0.09	0.52	0.7	1.31	0.28	0.09
	9	07/16/1996	0934	3.28	0.24	0.86	3.25	0.31	0.17	0.5	0.98	0.14	0.07
	8	08/20/1996	0953	1.74	0.16	0.67	1.75	0.7	<0.01	1.8	2.50	0.29	0.1
	8	09/23/1996	1048	2.97	0.17	0.63	2.58	0.17	0.08	1.6	1.85	0.06	0.06
Average				2.56	0.26	0.74	2.30	0.32	0.25	1.06	1.51	0.16	0.07
LB-4	9	05/01/1997	1317	1.16	0.09	0.2	1.19	0.09	0.77	0.6	1.46	0.13	
	9	06/02/1997	1039	1.3	0.12	0.16	1.1	0.13	0.81	1.4	2.34	0.16	0.05
	7	07/22/1997	0917	4.21	0.23	1.45	2.62	0.11	0.74	1.4	2.25	0.13	0.05
	8	08/26/1997	0928	4.29	0.12	0.9	2.2	0.39	0.12	0.8	1.31	0.24	0.08
	Average			2.74	0.14	0.68	1.78	0.18	0.61	1.05	1.84	0.17	0.06
LB-4	10	04/13/1998	1110	1.73	<0.05	0.18	1.1	0.05	0.51	1	1.56	0.09	0.04
	10	05/11/1998	0955	1.11	0.09	0.1	0.65	0.02	0.65	1	1.67	0.12	0.02
	10	06/09/1998	1110	1.08	<0.05	0.16	0.57	0.16	0.59	0.8	1.55	0.1	0.07
	10	07/13/1998	0925	1.6	0.11	0.44	0.81	<0.02	0.62	1.1	1.72	0.13	0.05
	9	08/10/1998	1049	0.65	0.18	0.46	0.84	0.19	0.28	1	1.47	0.28	0.12
	8	09/08/1998	1038	2.11	0.1	0.22	0.83	0.06	0.04	0.5	0.60	0.09	0.01
Average				1.38	0.12	0.26	0.80	0.10	0.45	0.90	1.43	0.14	0.05
LB-4	10	04/20/1999	0925	0.28	<0.05	<0.05	0.09	U	0.79	U	0.79	0.11	0.1
	8	05/10/1999	1018	0.54	<0.05	0.25	0.08	U	0.89	0.36	1.25	0.1	0.06
	9	06/15/1999	1004	2.27	0.06	0.87	0.17	0.02	0.77	0.7	1.49	0.08	0.04
	8	07/12/1999	0833	1.63	0.06	0.88	0.15	0.17	0.64	0.71	1.52	0.11	0.02
	8	08/16/1999	0948	1.65	0.05	0.6	0.12	0.26	0.04	1.17	1.47	0.2	0.04
	8	09/14/1999	0918	2.86	<0.05	0.63	0.13	0.13	U	1.62	1.75	0.39	0.04
Average				1.54	0.06	0.65	0.12	0.15	0.63	0.91	1.38	0.17	0.05
LB-10	0.1	06/05/1995	1115					0.1		0.6	0.70	0.11	0.08
	0.1	07/10/1995	1000					<0.02		0.9	0.90	0.13	0.02
	0.1	08/21/1995	1005					0.02		1	1.02	0.22	0.01
	0.1	09/19/1995	1050					0.03		2.2	2.23	<0.01	<0.01
Average								0.05		1.18	1.21	0.15	0.04
LB-10	0.1	04/16/1996	1200	0.95	0.24	0.17	0.76	0.02	0.07	1.1	1.19	0.08	0.01
	0.1	06/04/1996	1110	3.18	0.44	1.32	3.26	0.08	0.36	0.7	1.14	0.25	0.05
	0.1	07/16/1996	1045	3.1	0.22	0.83	3.04	0.02	0.18	0.3	0.50	0.2	<0.01
	0.1	08/20/1996	1050	1.81	1.06	0.43	1.79	0.04	0.07	0.9	1.01	0.12	0.05
	0.1	09/23/1996	0920	2.31	0.3	0.22	1.55	0.03	<0.01	3.4	3.43	0.28	0.07
Average				2.27	0.45	0.59	2.08	0.04	0.17	1.28	1.45	0.19	0.05

Station	Depth (M)	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
LB-10	0.1	05/01/1997	1440	0.73	0.14	0.06	0.77	0.05	0.86	1.4	2.31	0.18	
	0.1	06/02/1997	1105	11.04	0.25	2.91	5.64	0.4	1.2	1.6	3.20	0.1	0.06
	0.1	07/22/1997	1030	4.98	0.22	1.35	2.2	0.09	0.28	1.8	2.17	0.05	0.03
	0.1	08/26/1997	1100	4.22	0.46	0.75	2.15	<0.02	0.14	0.6	0.74	0.15	0.04
Average				5.24	0.27	1.27	2.69	0.18	0.62	1.35	2.11	0.12	0.04
LB-10	0.1	04/13/1998	1000	0.3	<0.05	0.06	0.09	0.2	0.58	1.9	2.68	0.19	0.08
	0.1	05/11/1998	1010	1.49	0.07	0.55	0.67	0.05	0.63	1.1	1.78	0.1	0.02
	0.1	06/09/1998	0950	4.49	0.22	1.25	1.61	0.24	0.62	1.2	2.06	0.08	0.06
	0.1	07/13/1998	1005	2.75	0.3	0.86	1.22	0.05	0.51	1.5	2.06	0.15	0.02
	0.1	08/10/1998	0945	1.77	0.15	0.35	0.86	<0.02	0.07	1	1.07	0.11	0.04
	0.1	09/08/1998	0930	1.97	0.08	0.28	0.71	0.11	0.04	0.7	0.85	0.17	0.02
Average				2.13	0.16	0.56	0.86	0.13	0.41	1.23	1.75	0.13	0.04
LB-10	0.1	04/20/1999	0945	0.36	<0.05	0.19	0.08	U	0.74	0.63	1.37	0.1	0.01
	0.1	05/10/1999	1040	2.5	0.05	1.43	0.16	0.08	0.95	0.69	1.72	0.14	0.06
	0.1	06/15/1999	1050	2.74	0.07	1.11	0.22	U	0.63	0.86	1.49	0.09	0.03
	0.1	07/12/1999	0925	2.97	0.09	1.03	0.37	0.29	0.08	2.32	2.69	0.37	0.07
	0.1	08/16/1999	1045	1.96	<0.05	0.44	0.14	0.05	0.01	0.98	1.04	0.09	0.01
	0.1	09/14/1999	0940	1.86	<0.05	0.49	0.1	0.04	U	0.87	0.91	0.13	0.03
Average				2.07	0.07	0.78	0.18	0.12	0.48	1.06	1.54	0.15	0.04
LB-10	6	06/05/1995	1121					0.21		0.7	0.91	0.22	0.16
	5	07/10/1995	1005					0.22		1.7	1.92	0.47	0.29
	4	08/21/1995	1009					0.43		1.5	1.93	0.49	0.08
	4	09/19/1995	1054					0.06		3.9	3.96	0.04	<0.01
Average								0.23		1.95	2.18	0.31	0.18
LB-10	5	04/16/1996	1205	0.88	0.25	0.13	0.76	0.02	0.06	1	1.08	0.08	0.01
	5	06/04/1996	1115	3.89	0.35	0.94	3.96	0.35	0.58	0.9	1.83	0.48	0.09
	5	07/16/1996	1050	2.9	0.34	0.74	2.29	1.24	<0.01	1.3	2.54	0.35	0.13
	4	08/20/1996	1054	2.09	1.46	2	1.56	0.23	0.08	1.3	1.61	0.3	0.07
	2	09/23/1996	0922	2.7	0.24	1.34	1.63	0.03	<0.01	4.5	4.53	0.58	0.09
Average				2.49	0.53	1.03	2.04	0.37	0.24	1.80	2.32	0.36	0.08
LB-10	5.5	05/01/1997	1446	0.7	0.22	0.11	0.22	0.16	1.05	0.9	2.11	0.13	
	4	06/02/1997	1109	13.04	0.19	2.97	5.64	0.3	1.24	1.6	3.14	0.11	0.07
	4	07/22/1997	1034	4.43	0.21	1.42	2.48	0.22	0.45	1.4	2.07	0.13	0.05
	3	08/26/1997	1103					0.12	0.05	1.4	1.57	0.11	0.04
Average				6.06	0.21	1.50	2.78	0.20	0.70	1.33	2.22	0.12	0.05

Station	Depth (M)	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg / L	T - Phos mg/L	T - Ortho-P mg/L
LB-10	4	04/13/1998	1004	0.16	<0.05	0.11	0.1	0.2	0.58	2.2	2.98	0.25	0.09
	5	05/11/1998	1015	0.77	0.06	0.17	0.41	0.24	0.48	4.5	5.22	1.83	0.02
	5	06/09/1998	0955	3.85	0.09	1.27	1.5	0.03	0.73	1.4	2.16	0.24	0.08
	5	07/13/1998	1010	2.02	0.21	0.63	0.68	0.11	0.29	1.5	1.90	0.35	0.04
	5	08/10/1998	0950	1.63	0.14	0.36	0.78	0.46	0.09	2.3	2.85	0.52	0.17
	4	09/08/1998	0934	1.92	0.07	0.26	0.76	0.17	0.04	0.6	0.81	0.12	0.06
Average				1.73	0.11	0.47	0.71	0.20	0.37	2.08	2.65	0.55	0.08
LB-10	5	04/20/1999	0950	2.57	0.1	1.54	0.16	0.33	2.66	1.76	4.75	0.25	0.08
	5	05/10/1999	1045	10.9	0.14	3.55	0.25	0.13	0.81	0.95	1.89	0.23	0.08
	4	06/15/1999	1054	2.81	0.09	1.01	0.22	U	0.68	0.72	1.40	0.11	0.04
	4	07/12/1999	0929	3.45	0.08	1.03	0.35	0.24	0.01	2.57	2.82	0.47	0.12
	4	08/16/1999	1049	1.83	<0.05	0.4	0.12	0.07	0.02	1.24	1.33	0.25	0.05
	3	09/14/1999	0943	1.93	<0.05	0.56	<0.04	0.15	U	2.24	2.39	0.58	0.08
Average				3.92	0.10	1.35	0.22	0.18	0.84	1.58	2.43	0.32	0.08
LB-11	0.1	06/05/1995	1030					0.14		0.8	0.94	0.17	0.09
	0.1	07/10/1995	1030					0.05		1.2	1.25	0.19	0.09
	0.1	08/21/1995	1035					<0.02		1.2	1.20	0.23	0.02
	0.1	09/19/1995	1020					0.02		4.3	4.32	0.06	<0.01
Average								0.07		1.88	1.93	0.16	0.07
LB-11	0.1	04/16/1996	1100	0.53	0.18	0.08	0.49	<0.02	0.13	0.9	1.03	0.08	0.01
	0.1	06/04/1996	1030	3.44	0.42	1.76	3.26	0.11	0.46	0.7	1.27	0.29	0.08
	0.1	07/16/1996	1010	3.27	0.18	0.68	2.72	0.09	0.49	0.4	0.98	0.12	<0.01
	0.1	08/20/1996	1020	1.47	0.3	1.11	1.42	0.13	0.05	0.6	0.78	0.38	0.05
	0.1	09/23/1996	0950	3.9	1.2	0.4	0.7	0.06	0.42	1.8	2.28	0.13	0.04
Average				2.52	0.46	0.81	1.72	0.10	0.31	0.88	1.27	0.20	0.05
LB-11	0.1	05/01/1997	1558	0.4	<0.10	0.5	<0.10	0.1	1.01	1.2	2.31	0.03	
	0.1	06/02/1997	1200	14.28	0.5	3.04	2.68	0.34	1.08	1.9	3.32	0.11	0.09
	0.1	07/22/1997	0950	7.7	0.49	1.43	3.7	0.16	0.41	1.9	2.47	0.05	0.03
	0.1	08/26/1997	1010	4.93	0.18	0.66	2.18	0.02	0.15	0.6	0.77	0.05	0.04
Average				6.83	0.39	1.41	2.85	0.16	0.66	1.40	2.22	0.06	0.05
LB-11	0.1	04/13/1998	0942	0.15	<0.05	0.07	0.09	0.18	0.53	1.4	2.11	0.15	0.05
	0.1	05/11/1998	1035	3.65	0.22	1.66	1.6	0.04	0.46	1.3	1.80	0.1	0.01
	0.1	06/09/1998	1025	3.52	0.15	1.1	1.42	0.16	0.73	0.9	1.79	0.07	0.05
	0.1	07/13/1998	0940	2.66	0.42	0.79	1.17	0.04	0.63	1.6	2.27	0.15	0.03
	0.1	08/10/1998	1015	1.71	0.16	0.42	0.8	0.03	0.03	1	1.06	0.09	0.04
	0.1	09/08/1998	1000	1.92	0.07	0.35	0.78	0.09	0.04	0.7	0.83	0.21	0.05
Average				2.27	0.20	0.73	0.98	0.09	0.40	1.15	1.64	0.13	0.04

Station	Depth (M)	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
LB-11	0.1	04/20/1999	1015	0.33	<0.05	0.19	0.05	0.06	0.76	1.19	2.01	0.16	0.03
	0.1	05/10/1999	1155	1.8	<0.05	0.98	0.1	0.01	0.65	1.42	2.08	0.16	0.07
	0.1	06/15/1999	1020	2.79	0.09	0.99	0.2	0.04	0.88	0.88	1.80	0.14	0.08
	0.1	07/12/1999	0905	2.21	0.09	0.83	0.14	0.03	0.42	1	1.45	0.15	0.05
	0.1	08/16/1999	1010	2.22	<0.05	0.43	0.14	0.02	U	1.06	1.08	0.11	0.03
	0.1	09/14/1999	1020	1.99	<0.05	0.52	0.12	0.03	U	1.02	1.05	0.17	0.05
Average				1.89	0.09	0.66	0.13	0.03	0.68	1.10	1.58	0.15	0.05
LB-11	7	06/05/1995	1037					0.33		0.8	1.13	0.19	0.15
	4	07/10/1995	1034					0.23		1.5	1.73	0.36	0.23
	6	08/21/1995	1041					1.26		2.6	3.86	0.79	0.9
	5	09/19/1995	1025					0.04		1.8	1.84	0.07	<0.01
Average								0.47		1.68	2.14	0.35	0.43
LB-11	5	04/16/1996	1105	0.57	0.14	0.14	0.47	<0.02		1.7	1.70	0.1	0.01
	4	06/04/1996	1034	0.19	<0.05	<0.05	0.1	0.19	0.39	0.8	1.38	0.32	0.12
	5	07/16/1996	1015	2.66	0.29	0.77	2.28	0.31	0.17	0.6	1.08	0.23	<0.01
	3	08/20/1996	1023	1.38	0.11	0.33	1.25	0.12	0.04	1.1	1.26	0.32	<0.01
	5	09/23/1996	0955	1.94	0.16	0.41	1.72	0.11	0.08		0.19	0.91	0.06
Average				1.35	0.18	0.41	1.16	0.18	0.17	1.05	1.12	0.38	0.06
LB-11	5	05/01/1997	1603	0.69	<0.05	0.05	0.97	0.12	0.96	1.4	2.48	0.1	
	6	06/02/1997	1206	13.12	0.86	2.92	8.92	0.39	1.03	2.3	3.72	0.21	0.12
	5	07/22/1997	0955	6.5	0.54	1.35	3.3	0.43	0.22	3.3	3.95	0.27	0.03
	3	08/26/1997	1013	4.37	0.27	0.62	2.18	0.05	0.18	0.9	1.13	0.3	0.05
Average				6.17	0.56	1.24	3.84	0.25	0.60	1.98	2.82	0.22	0.07
LB-11	6	04/13/1998	0948	0.09	<0.05	0.05	<0.04	0.2	0.45	2.1	2.75	0.25	0.07
	5	05/11/1998	1040	0.81	0.09	0.25	0.44	0.06	0.61	1.2	1.87	0.15	0.03
	5	06/09/1998	1030	3.38	0.07	1.07	1.36	0.17	0.74	1.4	2.31	0.19	0.06
	6	07/13/1998	0946	1.19	0.23	0.31	0.34	0.9	0.06	3.3	4.26	0.96	0.05
	5	08/10/1998	1020	1.54	0.26	0.42	0.95	0.42	0.1	1.7	2.22	0.61	0.13
	4	09/08/1998	1004	2.2	0.08	0.29	0.79	0.09	0.04	0.5	0.63	0.09	0.06
Average				1.54	0.15	0.40	0.78	0.31	0.33	1.70	2.34	0.38	0.07
LB-11	4	04/20/1999	1019	1.54	<0.05	1.06	0.09	0.2	1.35	1.62	3.17	0.3	0.06
	5	05/10/1999	1200					0.18	0.38	2	2.56	0.54	0.09
	4	06/15/1999	1024	2.17	0.06	0.87	0.17	0.1	0.7	1.15	1.95	0.23	0.04
	4	07/12/1999	0909	2.12	0.07	0.7	0.17	0.06	0.48	1.59	2.13	0.37	0.09
	4	08/16/1999	1014	2.24	<0.05	0.4	0.15	0.23	0.11	1.09	1.43	0.17	0.04
	3	09/14/1999	1023	2.04	0.05	0.52	0.13	U	U	1.55	1.55	0.4	0.08
Average				2.02	0.06	0.71	0.14	0.15	0.60	1.50	2.13	0.34	0.07

Station	Depth (M)	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg / L	T - Phos mg/L	T - Ortho-P mg/L
LB-18	0.1	06/05/1995	0700					0.15		0.9	1.05	0.19	0.13
	0.1	07/10/1995	0700					0.09		1.4	1.49	0.29	0.13
	0.1	08/20/1995	1545					0.03		1.3	1.33	0.43	0.12
	0.1	09/18/1995	1800					2.3		9.9	12.20	0.45	0.01
Average								0.64		3.38	4.02	0.34	0.10
LB-18	0.1	04/16/1996	1530	0.6	0.18	0.14	0.47	0.73	0.06	4.8	5.59	0.47	0.04
	0.1	06/04/1996	0800	5.83	0.73	1.09	4.06	0.25	1.91	1.1	3.26	0.36	0.1
	0.1	07/15/1996	1500	7.19	0.23	0.3	2.32	6.73	1.85	6.7	15.28	1.35	0.9
	0.1	08/20/1996	0700	1.65	1.1	1.3	1.63	0.34	0.89	1.8	3.03	0.61	0.31
	0.1	09/23/1996	0730	1.66	0.18	0.19	0.88	3.1	0.1		3.20	0.29	0.81
Average				3.39	0.48	0.60	1.87	2.23	0.96	3.60	6.07	0.62	0.43
LB-18	0.1	05/02/1997	0850	0.19	0.17	<0.05	0.08	0.28	0.17	2.4	2.85	0.15	
	0.1	06/02/1997	0835	23	0.41	4	7.55	0.38	4.61	1.9	6.89	0.15	0.11
	0.1	07/22/1997	0745	3.76	0.47	0.96	1.29	1.46	0.23	3.7	5.39	0.26	0.16
	0.1	08/26/1997	0745	3.09	0.33	0.27	1.34	0.11	0.29	1.1	1.50	0.16	0.09
Average				7.51	0.35	1.74	2.57	0.56	1.33	2.28	4.16	0.18	0.12
LB-18	0.1	04/13/1998	0850	0.09	<0.05	<0.05	0.03	0.27	0.52	3.3	4.09	0.3	0.08
	0.1	05/11/1998	0800	3.76	0.14	1.07	1.7	0.06	0.51	1.1	1.67	0.09	0.02
	0.1	06/09/1998	0815	6.1	5	1.73	0.92	0.17	2.86	2.7	5.73	0.41	0.16
	0.1	07/13/1998	0805	0.7	0.21	0.17	0.16	0.04	0.14	1.4	1.58	0.21	0.04
	0.1	08/10/1998	0800	0.3	0.22	<0.05	0.07	0.03	0.09	0.7	0.82	0.14	0.06
	0.1	09/08/1998	0820	0.27	0.07	<0.05	0.06	0.07	0.08	0.5	0.65	0.29	0.1
Average				1.87	1.13	0.99	0.49	0.11	0.70	1.62	2.42	0.24	0.08
LB-18	0.1	04/20/1999	0830	0.31	<0.05	0.1	0.07	U	0.71	0.7	1.41	0.25	0.03
	0.1	05/10/1999	0855	4.93	0.14	2.38	0.23	0.04	1.26	0.72	2.02	0.19	0.07
	0.1	06/15/1999	0815	4.05	0.09	1.3	0.33	0.15	0.48	1.58	2.21	0.27	0.07
	0.1	07/12/1999	1000	1.96	0.23	1.86	0.33	U	0.06	1.72	1.78	0.33	0.05
	0.1	08/16/1999	0835	2.31	<0.05	0.34	0.15	U	0.02	2.13	2.15	0.33	0.05
	0.1	09/14/1999	0740	2.63	0.18	1.64	0.5	0.1	U	1.77	1.87	0.21	0.03
Average				2.70	0.16	1.27	0.27	0.10	0.51	1.44	1.91	0.26	0.05
LB-19	0.1	06/05/1995	0740					0.09		0.9	0.99	0.2	0.09
	0.1	07/10/1995	0720					0.08		1.2	1.28	0.26	0.14
	0.1	08/20/1995	1515					0.06		1.4	1.46	0.36	0.06
	0.1	09/18/1995	1735					<0.02		2.2	2.20	0.12	0.08
Average								0.08		1.43	1.48	0.24	0.09

Station	Depth (M)	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
LB-19	0.1	04/16/1996	1545	0.29	0.05	<0.05	0.18	<0.02	<0.01	0.7	0.70	0.07	0.02
	0.1	06/04/1996	0730	1.41	0.19	0.3	1.4	0.12	0.16	0.9	1.18	0.28	0.06
	0.1	07/15/1996	1515	1.23	0.3	0.21	0.84	0.07	0.1	0.8	0.97	0.17	<0.01
	0.1	08/20/1996	0720	0.1	0.11	<0.05	0.04	0.09	0.31	2	2.40	0.51	0.09
	0.1	09/23/1996	0800	0.17	0.13	<0.05	0.05	0.02	2.58	2	4.60	0.16	0.02
Average				0.64	0.16	0.26	0.50	0.08	0.79	1.28	1.97	0.24	0.05
LB-19	0.1	05/02/1997	0925	0.09	<0.05	<0.05	<0.04	0.07	0.01	0.4	0.48	0.06	
	0.1	06/02/1997	0820	17	0.57	2.62	2.07	0.1	1.97	1.3	3.37	0.08	0.07
	0.1	07/22/1997	0800	4.01	0.25	0.48	1.25	0.13	0.16	1.6	1.89	0.06	0.04
	0.1	08/26/1997	0730	1.79	0.1	0.07	0.42	<0.02	0.05	1.2	1.25	0.06	0.03
	Average			5.72	0.31	1.06	1.25	0.10	0.55	1.13	1.75	0.07	0.05
LB-19	0.1	04/13/1998	0910	<0.05	<0.05	<0.05	<0.04	0.11	0.28	1.7	2.09	0.2	0.05
	0.1	05/11/1998	0820	4.83	0.3	0.61	0.66	0.11	1.41	1.1	2.62	0.13	0.04
	0.1	06/09/1998	0830	42.9	2.53	11.7	12.1	0.51	5.84	3.6	9.95	0.66	0.25
	0.1	07/13/1998	0820	0.62	0.12	0.15	0.13	0.05	0.12	1.1	1.27	0.21	0.03
	0.1	08/10/1998	0810	0.68	0.07	0.19	0.19	0.04	0.07	0.8	0.91	0.14	0.1
	0.1	09/08/1998	0815	0.76	0.13	0.14	0.19	0.07	0.2	0.6	0.87	0.11	0.03
	Average			9.96	0.63	2.56	2.65	0.15	1.32	1.48	2.95	0.24	0.08
LB-19	0.1	04/20/1999	0800	0.32	<0.05	0.15	0.07	U	0.74	0.71	1.45	0.23	0.03
	0.1	05/10/1999	0835	0.94	<0.05	0.41	0.07	U	0.22	0.35	0.57	0.13	0.06
	0.1	06/15/1999	0750	14.9	0.2	1.39	0.26	0.12	1.82	2.82	4.76	0.62	0.04
	0.1	07/12/1999	0950	2.92	0.09	0.46	0.13	U	U	1.27	1.27	0.12	0.02
	0.1	08/16/1999	0810	1.42	0.07	0.12	0.11	0.09	0.04	1.3	1.43	0.15	0.01
	0.1	09/14/1999	0755	1	0.05	<0.05	0.08	U	U	1.38	1.38	0.2	0.04
Average				3.58	0.10	0.51	0.12	0.11	0.71	1.31	1.81	0.24	0.03